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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/551,408
Filing Date: April 18, 2000
Appellant(s): IVRI ET AL.

David W. Boyd
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 11, 2011 appealing from the
Final Office action mailed June 15.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

WO 97/07896	IVRI et al.	03-1997
US 5,487,378	ROBERTSON et al.	01-1996
4,944,798	ABYS et al.	03-1990

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ivri et al. (WO 97/07896) in view of Robertson, et al. (US 5,487,378).

Regarding claim 40, Ivri et al., disclose a method of aerosolizing (nebulizing) a liquid, comprising the steps of forming a vibratable aperture plate (Figure 13A shows an a vibratable aperture plate with a thin shell member) , the aperture plate having a front surface (top) and a rear surface (bottom), the aperture plate being formed to form a plurality of tapered conical-shaped apertures (Figures 6 & 7) extending from the rear surface to the front surface, the plurality of apertures being tapered to narrow from the rear surface to the front surface, the aperture plate (Figure 13A) further being formed to have a dome shape (Figure 13A), mounting the vibratable aperture plate (Figures 2, 13

and 20) upon a support member (26, 166, 230) wherein substantially all of a vibratable portion (thin shell member) of the aperture plate not directly mounted to the support member (the dome portion forming the thin shell member) comprises the dome shape: providing a fluid (42 in figure 2) at the rear surface of the aperture plate; and vibrating the aperture plate to eject the fluid through the plurality of tapered conical-shaped apertures. See: page 5, line 16 to page 7, line 2.

However, Ivri lacks the specific teaching of electroforming the vibratable aperture plate of palladium or a palladium alloy and the palladium or palladium alloy aperture plate being electroformed to form the plurality of tapered conical-shaped apertures.

Robertson et al. teaches a method of aerosolizing a liquid including the steps of electroforming a metal or metal alloy plate (e.g. nickel; col. 11, lines 22-23) to have apertures which taper smaller going from a back surface to the front surface where the droplets will be released; providing liquid at the rear surface of the plate; and vibrating the plate to eject fluid droplets through the apertures (col. 2, lines 48-64; col. 3 lines, 24-52; col. 11, lines 21-23) and that all surfaces in contact with the liquid may be coated with a protective layer to prevent corrosion. See: col. 11, lines 8-23.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of nebulizing a liquid, as disclosed by Ivri, by electroforming a metal or metal alloy plate, as taught by Robertson, with the dome shape having tapered apertures, as disclosed by Ivri, in order to provide these surfaces with a protective layer to prevent corrosion since these parts are in contact with the liquid in Ivri.

Claims 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ivri et al. (WO 97/07896) and Robertson, et al. (US 5,487,378), as applied to claim 1 above, and further in view of Abys et al (4,911,798).

The combined references teach all the limitations of claims 41-42, except the electroforming step being carried out with the aperture plate being palladium cobalt or palladium nickel.

Abys teaches that Palladium metal and alloys are used as protective coatings, are chemically inert, are hard and wear well and do not form oxide surface coatings. Abys specifically teaches that palladium-nickel and palladium-cobalt alloys are advantageous used in electroplating because the plating potential for the pairs of metals (e.g. palladium and nickel) are close together and well removed from the hydrogen evolution potential. Moreover, Abys teaches that typical alloying metals are silver, copper, nickel, cobalt, gold, chromium, manganese, ruthenium, rhodium, platinum and iridium; but specifically teaches that particularly useful are copper, nickel, cobalt and silver with the preferred alloys comprising at least 10 mole percent palladium, remainder copper, nickel, cobalt and/or silver. Other useful alloys are 40, 60 or 80 mole percent palladium, remainder silver, nickel, cobalt and/or silver. See: col. 1, lines 20-43; col. 3, lines 45-62; col. 6, lines 36-45; and claims 1-5 & 9-10.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used palladium-nickel or palladium-cobalt alloys, as taught by Abys, in order to electroform the aperture plate, as taught by Robertson, with a dome shape having tapered apertures therethrough, as disclosed by Ivri, with a protective

layer, using a well known palladium alloy for its art recognized purpose, which is to provide a protective layer using metal alloys that are inert, hard and wear well.

Regarding claim 43, Abys teaches useful alloy metals are 40, 60, or 80 mole percent palladium, remainder silver, nickel, cobalt, and/or silver. Moreover, differences in concentration will not support the patentability of subject matter encompassed by the prior art because it is not inventive to discover the optimum or workable ranges by routine experimentation.

(10) Response to Argument

Appellant's arguments filed April 11, 2011 to the rejection of claim 40 under 35 U.S.C. 103(a), as being unpatentable over Ivri et al. (WO 97/07896) in view of Robertson, et al. (US 5,487,378), have been fully considered but they are not persuasive.

Appellant argues on page 4, Section 7 (A) that this rejection is improper because the Office Action has not made out a *prima facie* case of obviousness with respect to claim 40, as the references, even in combination, do not disclose all of the elements of claim 40 because claim 40 recites in part electroforming a vibratable aperture plate made of palladium or a palladium alloy and that the reasoning offered by the Office Action is based on speculation and hindsight reconstruction and therefore does not supply a rationale underpinning for the rejection.

However the examiner respectfully disagrees as it is proper to take into consideration not only the teachings of the prior art, but also the level of ordinary skill in the art. In re Luck, 476 F. 2d 650, 177 USPQ 523 (CCPA 1973). Specifically, those of

ordinary skill in the art are presumed to have some knowledge of the art apart from what is expressly disclosed in the references. In re Jacoby, 309 F.2d 513, 135 USPQ 317 (CCPA 1962).

In the instant case Ivri was used to disclose the aperture plate and Robertson teaches metals and metal alloys such as nickel for electroforming a nozzle array and specifically teaches using nickel. Palladium and palladium alloys are well known materials for electroforming, as admitted by Appellant on page 12, line 19 to page 13, line 1 of the Specification. Moreover, a skilled artisan would readily recognize that Palladium is in the same Group (i.e. the nickel family) on the periodic table as nickel and would therefore be expected to have similar electroforming properties because elements in a group have similar configurations of the outermost electron shells and most chemical properties are dominated by the orbital location of the outermost electron.

Therefore, using palladium or a palladium alloy, which have been known in the art for electroforming, would be obvious to the skilled artisan in light of the "electroformed metal or metal alloy such as nickel" teaching of Robertson, as this would be the simple substitution of one known element for another that are known to be used in electroplating and electroforming and are in the same group or family (the nickel family) in the periodic table.

Therefore, Appellant's arguments have not been found convincing and the rejection of claim 40 has been MAINTAINED for the reasons set forth above, as well as those found in the Final rejection mailed June 15, 2010.

Appellant's arguments filed April 11, 2011 to the rejection of claims 41-43 under 35 U.S.C. 103(1), as being unpatentable over Ivri et al. (WO 97/07896) and Robertson, et al. (US 5,487,378), as applied to claim 1 above, and further in view of Abys et al (4,911,798), have been fully considered but they are not persuasive.

Appellant then argues on page 5, Section 7 (B) that claims 41-43 depend from claim 40 and add further limitations and are therefore believed allowable at least by virtue of their dependence from an allowable base claim, as neither Ivri, Robertson, nor Abys teaches electroforming from palladium or a palladium alloy. However, the examiner respectfully disagrees for the reasons set forth above with regard to claim 40. Moreover, Abys teaches that typical electroplating alloying metals are silver, copper, nickel, cobalt, gold, chromium, manganese, ruthenium, rhodium, platinum and iridium; but specifically teaches that particularly useful are copper, nickel, cobalt and silver with the preferred alloys comprising at least 10 mole percent palladium, remainder copper, nickel, cobalt and/or silver. Other useful alloys are 40, 60 or 80 mole percent palladium, remainder silver, nickel, cobalt and/or silver. See: col. 1, lines 20-43; col. 3, lines 45-62; col. 6, lines 36-45; and claims 1-5 & 9-10.

Appellant then argues that electroplating is not the same as electroforming, and that Appellants do not use palladium or a palladium alloy to simply form a protective layer, as Appellants electroform the entire aperture plate of palladium or a palladium alloy.

The examiner respectfully agrees that electroforming is different than electroplating in that electroforming is a metal forming process that forms thin parts

through the **electroplating process**. (Bolding added for emphasis). The part is produced by plating a metal skin onto a base form, known as a mandrel, which is removed after plating. This process differs from electroplating in that the plating is much thicker and can exist as a self-supporting structure when the mandrel is removed. However, the examiner asserts that the electroformed material would have the same metal external surface as an electroplated material (i.e. a metal or metal alloy outer surface).

Moreover, this rejection was based upon the combination of references and Robertson was used to teach electroforming. If fact, Abys was only used to teach the particular metals palladium-cobalt and palladium-nickel and Abys gives specific reasons for using these metals (i.e. palladium-nickel and palladium-cobalt alloys are advantageous used in electroplating because the plating potential for the pairs of metals (e.g. palladium and nickel) are close together and well removed from the hydrogen evolution potential).

Appellants then argue that the combination of Robertson, which teaches nozzles fabricated from an electroformed metal or metal alloy such as nickel, in view of Abys, which teaches electroplating using the particular metals palladium-cobalt and palladium-nickel, which have protective coatings that are chemically inert, are hard and wear well and do not form oxide surface coatings only explains why these alloys are suitable for electroplating, and still does not explain why one of skill in the art would have thought to electroform the entire aperture plate from palladium or a palladium alloy, rather than simply using electroplating.

Here the examiner again relies upon Robertson's teaching that the nozzle array may be fabricated from an electroformed metal or metal alloy such as nickel and that electroforming is a metal forming process that forms thin parts through the **electroplating process** and the electroformed material would have the same metal external surface as an electroplated material (i.e. a metal or metal alloy outer surface). (Bolding added for emphasis).

Therefore, Appellant's arguments have not been found convincing and the rejection of claims 41-43 has been MAINTAINED for the reasons set forth above, as well as those found in the Final rejection mailed June 15, 2010.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Conclusion

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Clinton Ostrup/
Examiner, Art Unit 3771

/Justine R Yu/
Supervisory Patent Examiner, Art Unit 3771

/BOYER D ASHLEY/
Supervisory Patent Examiner, Art Unit 3724